March 31, 2009
NOVA-doc-3682

February, 2009
NOvA Monthly Report

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Project Office Overview

(J. Cooper)

Due to the FY08 Omnibus Appropriations Bill of December 2007, the NOvA resource loaded schedule was reworked for a February 2009 restart. This schedule now serves as the NOvA Project baseline approved for CD-2 in September 2008. When funding for NOvA was restored in July 2008 by the FY08 Supplemental Appropriations Bill, the project began working on tasks in advance of this baseline schedule and reached a positive schedule variance of 1.4 M$ in January 2009 on 17.6 M$ of scheduled work. This can also be expressed as a Schedule Performance Index (SPI) of 1.08.

This is the February 2009 Monthly report, and so real time has now caught up with the slipped baselined schedule. As you will see in this report, the project SPI dropped to 0.99 in February with a negative schedule variance of 0.2 M$ on 20.1 M$ of scheduled work. This indicates that the project is now just on schedule.

Future performance now depends on the results of the FY09 Appropriation and on possible funding via the America Recovery and Reinvestment Act (Stimulus Bill). These congressional actions were still in progress during February.

In addition to funding, future NOvA performance also depends on full staffing of the project. In this aspect, almost all the required NOvA staff was available in February with the two previously recognized problem areas beginning to see additional effort:

- NOvA data acquisition software effort continued to be a problem since Fermilab people had been reassigned to other higher priority projects. Meetings among the new NOvA data acquisition software manager with the re-assigned workers and a few new team members began to take place regularly in February.
- NOvA Project Controls effort had been a problem since Fermilab NOvA people were participating heavily in preparations for the FRA Earned Value Management System (EVMS) Certification process. This FRA effort declined during February and the team turned its attention back to NOvA.

During February the Ash River Site Preparation and Far Detector Building drawing package work advanced to a complete bid package. The University of Minnesota will handle this effort as part of a DOE Cooperative Agreement and anticipates the following schedule:

- March 3 Request for Proposals distribution
- March 9 Advertisement in the Minnesota State Register
- March 17 Mandatory Pre-Proposal Meeting in Minneapolis
- April 6 Deadline for Questions
- April 15 Proposals Due
- April 20 Proposal Review Complete, Short list of bidders developed
- April 24 Interview Short Listed firms
- April 28 Award of Contract

The extent of the Site and Building contract award will depend on the amount of funding from DOE that is in hand at the University of Minnesota on April 28. Currently only

$3M is in hand from the Cooperative Agreement FY09 Continuing Resolution allocation. The Site Preparation Package (phase one: access road and excavation, but no building construction) will require about $10M minimum, so additional funding will be needed to award phase one as scheduled. The Site and Building work is on the NOvA critical path.

The DOE OECM EVMS Certification Review of FRA has now been scheduled for the week of May 11.

The DOE Office of Science Internal Project Review for NOvA CD-3b has been proposed for July 21-23. This date was still under consideration by all parties at the end of February.

Glossary of Terms

A number of NOvA acronyms and other acronyms are often used in these monthly reports. In an effort to add clarity and reduce editing time, these acronyms are defined here in each report and are not always spelled out in the body of the text.

ACWP	Actual Cost of Work Performed
AD	Fermilab Accelerator Division
ADC	Main Ring Dipole , type A laminations, generation "C"
ADC	electronics, Analog to Digital Converter
ANL	Argonne National Laboratory
ANU	Accelerator and NuMI Upgrades
ARRA	America Recovery and Reinvestment Act of 2009
BCWP	Budgeted Cost of Work Performed
BCWS	Budgeted Cost of Work Scheduled
BOE	Basis of Estimate
BPM	Beam Position Monitor
CalTech	California Institute of Technology
CD	Fermilab Computing Division
CPI	Cost Performance Index = BCWP/ACWP
DCCT	DC Current Transformer
DCM	Data Control Module
DCS	Detector Control System
EA	Environmental Assessment
EAW	Environmental Assessment Worksheet (State of Minnesota)
EIR	External Independent Review
ESAAB	DOE Energy Systems Acquisition Advisory Board
EVMS	Earned Value Management System
FEA	Finite Element Analysis
FEB	Front End Board
FHEP	Full Height Engineering Prototype
FONSI	Finding of No Significant Impact
FRA	Fermi Research Alliance, the DOE Contractor for Fermilab
FSAP	Full Scale Assembly Prototype
FSO	Fermilab Site Office of DOE
IHEP	Institute of High Energy Physics (Russia)
IPND	Integration Prototype Near Detector
IPR	Internal Project Review (by DOE)
IU	Indiana University
LLRF	Low Level Radio Frequency
MI	Main Injector
MIE	Major Item of Equipment
MLAW	Recycler Injection Lambertson
MSU	Michigan State University
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding

N-27	NOvA PVC mixture, version 27 (the final choice)
NEPA	National Environment Preservation Act
NHPA	National Historic Preservation Act
NOVA-doc-####	document number in the NOvA document database
PDB	Power Distribution Box
PDD	Permanent Dipole
PDDW	Permanent Dipole Wide gap
PDS	Permanent Dipole Small
PFL	Pulse Forming Line
PPD	Fermilab Particle Physics Division
RLS	Resource Loaded Schedule
RQN	Recycler Quadrupole
RR	Recycler Ring
S E H	Short Elliot Hendrickson
SHPO	State Historic Preservation Officer
SMU	Southern Methodist University
SPI	Schedule Performance Index = BCWP/BCWS
TD	Fermilab Technical Division
TDU	Timing Distribution Units
TECC	Thermo-Electric Cooler Controller
THPO	Tribal Historic Preservation Officer
UCLA	Univ of California, Los Angeles
USACE	United States Army Corps of Engineers
UTD	University of Texas, Dallas

Narrative Summaries of Technical Progress

WBS 1.0 & 2.0 Accelerator & NuMI Upgrades

(P. Derwent)

1.0.1.1 Recycler Ring Modifications

The contract mechanical engineer hired in January compiled existing data for Injection Line planning with assistance of in house mechanical engineer, drafter, and physicist.

ADC magnet prototyping:

An Accelerator Division power supply was identified that is suitable for testing the ADCW magnets. Spacer/Coil design was finished. Drawings for other NON-spacer ancillary parts (manifolds & such) are still underway.

RQN magnet:

Simple trimming (i.e. washer adjustments) can only adjust the magnet by ~5%. Most magnets will need to be reduced by a greater amount. This will require swapping some magnetic bricks for smaller bricks. For that level of "trimming" the magnetizer/measurement system needs to be up and running so new (smaller) bricks can be prepared.

PDS magnets:

The vendor had to disassemble and reassemble the magnet with a corrected brick configuration. Disassembly has occurred but current tooling turned out to be insufficient for re-assembly due to the magnet strength. Tooling is being redesigned.

1.0.1.2 Recycler Kicker Systems

Work has mainly been concentrating on the off-project gap clearing kickers. Work on the NOVA/ANU project scope will ramp up later this year.

Winding began on four PFL's, but the rest of the cable has been delayed until mid-April. The manufacturer has to re-make the cable again.

Discussions continued on the design of the abort magnet. The case assembly has been drawn - further design requires electrical modeling.

Modeling of the RR Extraction / MI Injection magnet continued. Saturation effects and inductance were investigated. A decision was made to use CMD5005 ferrite with a permeability of 1200. Because this material has a lower permeability at higher frequency, the pulser will have to be slowed down. Drafting on the magnet is now waiting for the modeling.

1.0.1.3 Recycler Instrumentation

BPM--Work continued on finalizing the design of the BPM cables and transition boards. As the cable price quote is 1.5 years old, we recently requested another quote from a vendor and noted that the price is just a few percent higher than that quoted 1.5 years ago.

DCCT—We are evaluating the costs of purchasing off-the-shelf unit vs. design and fabrication in-house as noted in the design report.

1.0.1.4 Recycler Radiation Safety

Measurements were made in February in the regions near MI39 and MI14 as part of planning for penetration and gap clearing kicker installation in 2009. Progress continues on the updated MI shielding assessment.

1.0.2.1 MI Modifications

LLRF design works continues (has reached 40%). We received the VXI crates and controllers and we started developing the hardware and software for the system.

1.0.2.2 MI RF Cavities

Half of the six Higher Mode Dampers have been assembled and the rest will be completed as the machine shop parts come in.

The first Main Injector cavity is in the Test Station and is being evaluated. The second Main Injector cavity passed its water test and is now having its vacuum checked.

1.0.2.3 MI Radiation Safety

See 1.0.1.4

1.0.3.1 NuMI Primary Proton Beam

Procurements began for the Bμlb regulation systems for the six major dipole power supplies for the primary proton beam. These are CD-3a items.

1.0.3.2 NuMI Target Hall Technical Components

Work began on the task "assessment of baffle for higher beam-heating loads". To load-level the time of people, the start of the task "Analyze Current Hadron Monitor Design for Higher Beam Power" was delayed to follow the baffle task.

1.0.3.3 NuMI Target Hall Infrastructure

NuMI Target Hall Space Planning & Horn 2 Relocation to Medium Energy:
Work on the Horn 2 stripline extension assembly sketch continued. Thermal expansion and new location to anchor the stripline was worked out. Details of support of the stripline were sketched. Work continued on the task, "Design New Equipment for Operations".

Target Chase:
Work on the FE Analysis of Horn 1 stripline was re-started. A comprehensive multi-conductor model was developed and preliminary thermal results were obtained.

1.0.3.4 Decay Pipe, Hadron Absorber and Utilities

Work has begun to acquire necessary design input for the cooling water systems.

1.0.4 Beam Physics

Final ECloud detector fabrication was begun. A location in MI-52 was tentatively identified for a future installation (2010 or later). Beam Dynamics and ECloud

simulations continued with ORBIT. Optimization of the slip stacking procedure continued. Main Injector loss patterns with collimators were studied for NOvA era predictions; more measurements will be necessary to disentangle some of the loss mitigation techniques in use by the Main Injector.

WBS 2.0 ANU Construction

(P. Derwent)

2.0.2.1.1 Upgrade Vertical Quad Bus with New Transformer

A transformer was bought last year with accelerator division funds and we transferred the requisition to the NOVA project. The transformer waits approval by the AD EE support department. Expected delivery is 2 months.

2.0.3.3 NuMI Target Hall Infrastructure

Horn 2 Re-location to Medium Energy—Shielding Reconfiguration: Work continued on the task: "Final Design-Shielding Blocks & Remote Lifting Components". Structural Grade bolts were added to the T-Block design (to support the hanging steel), as a redundant system for added safety.

2.0.4 ANU Project Management

ANU management worked to identify potential applications of ARRA funds and investigated ways to streamline the status reporting system.

WBS 1.1 & 2.1 Site and Building

(S. Dixon)

1.1.1 Site conditions Investigation

1.1.1.1 Topographic Survey
1.1.1.2 Subsurface Investigation
1.1.1.3 Wetland Delineation
1.1.1.4 Revise Ash River Environmental Assessment Worksheet
These tasks are complete.

1.1.2. Title 1 Preparation

1.1.2.1 Site Preparation Advanced Technical Design
1.1.2.2 Building Design Modifications
1.1.4.1 Independent Cost Estimate Review
1.1.4.2 Secondary Containment Study
1.1.4.3 Overburden Study
1.1.4.5 Risk Management Assessment
These tasks are complete.

1.1.4.7 Advanced Technical Design – Far Detector Building

In February 2009, the construction documents were revised to incorporate the comments received during the Project Coordination Review in January 2009

2.1.1 Site Preparation Package

2.1.1.1 Site Preparation Package - Title 2 (Design) Phase

In February 2009, the construction documents were revised to incorporate the comments received during the Project Coordination Review in January 2009.

2.1.1.2 Site Preparation Package - Wetland Mitigation

Documentation for the purchase of the Wetland Credits was received in February 2009.

2.1.1.3 Site Preparation Package – Procurement Phase

Additional discussions with University of Minnesota and Hines personnel continued in February 2009. The goal remains to develop a procurement strategy similar to that described in the December 2009 report.

2.1.2 Far Detector Building

2.1.2.1 Far Detector Building - Title 2 (Design) Phase

The project team tasked an outside architectural/engineering firm to review the Far Detector Building documents and provide a general overview of the status of the documents and the suitability for the intended purpose. The comments from Crawford Murphy & Tilly were received in February 2009.

In February 2009, the construction documents were revised to incorporate the comments received during the Project Coordination Review in January 2009.

2.1.2.2 Far Detector Building – Procurement Phase

See description in 2.1.1.3 above.

2.1.2.3 Far Detector Building – Build Phase

No Activity this month.

2.1.3 Site and Building Security

The activities associated with this WBS item have been incorporated into the design of the Far Detector Building (WBS 2.1.2.1).

WBS 1.2 Liquid Scintillator

(S. Mufson)

1.2.1, 1.2.9 Requirements and Procurement

No change from last month.

1.2.4, 1.2.7 Production Methods

At Indiana several samples of scintillator with varying concentrations of fluors were prepared to study new tests of concentration. These samples were analyzed by Jon Karty of Indiana University Chemistry and the samples are being used in our exploration of the gamma test described below.

Three of the scintillators, 94% of baseline fluors, 100% of baseline fluors, 102% of baseline fluors had chemical analysis of the samples. The mass fractions measured for pseudocumene, PPO, and bis-MSB order the three samples by concentration correctly but do not give quanitative results better than about 5-10%.

1.2.2, 1.2.3, 1.2.8 R&D Studies

Indiana found a problem (see December 2008 monthly report) in the original alpha test, requiring investigation of alternative tests of composition. Tests continued during February on a system that uses a gamma source instead of an alpha source.

1.2.5 QA/QC

The IU gamma test setup consists of a gamma source that irradiates a scintillator sample and an alpha source encased in plastic scintillator that provides a calibration signal. The test parameter is the ratio of the channel that registers the scintillator's Compton edge to the channel that registers the calibration peak. The measurements are made with an MCA. The ratio should increase as the fluor concentration of scintillator increases. The low concentration of fluors should not saturate the scintillator light.

Preliminary analysis in February was inconclusive. Systematic errors may mask the effect, so work began addressing these systematic errors by improving the scintillator composition QA gamma test. These improvements include: adding the plastic scintillator + alpha source to monitor the electronics drift; adding new holder that attaches to the PMT and guarantees repeated positioning of the scintillator sample bottle.

The work at SMU was directed at resolving the discrepancies between measurements of attenuation length at SMU & IU for a common mineral oil sample. Test measurements are being performed that probe the beam profile in the SMU spectrometer as a function of oil column length. The measurements are in progress.

1.2.6 Shipping

1.2.7 Blending Investigations

1.2.8 Component Acquisition Investigations

1.2.9 Integration Prototype Detector Scintillator Production

1.2.10 Production Scintillator Specifications

1.2.11 Management – R&D Phase

No change from last month.

WBS 1.3 Wavelength Shifting Fiber

(C.Bromberg)

1.3.1 Requirements

1.3.2. Vendor Investigations

1.3.3 Wavelength Shifting Fiber Optimization Studies

No change this month.

1.3.4 Development of QA/QC Methods

At MSU, a number of tests with previously delivered fiber were completed. Multiple wraps (up to 10) were performed on the same section of fiber of preproduction fiber. The attenuation lengths are not affected at normal tension or when increased by 50%. Calibration of the fiber illumination at each hole was completed. Absolute calibration is better than 0.5%. Preliminary design of the transportable fiber scanner began.

1.3.5 Integration Prototype- Near Detector Production

100 kilometers of IPND fiber was delivered on February 9, and QA of the fiber was started. The first spool tested showed attenuation lengths as good as or better than most of the preproduction spools that were tested. Attenuation length at 580 nm was > 15 m.

1.3.6 Production WLS Fiber Specifications

1.3.7 Management – R&D Phase

No change during this month.

WBS 1.4 PVC Extrusions

(R. Talaga)

1.4.1 Physical Properties Determination and Test Method Development

N-27 PVC creep test stands at constant (room) temperature are in progress.

Tests to look for possible adverse effects of exposing N-27 PVC (under tension) to liquid scintillator have been ongoing for over a year. Samples of N-27 have now been removed and will be analyzed by examination with microscopes next month.

1.4.2 Raw Materials

1.4.3 Extrusions

No progress this month.

1.4.4 Shipping and Handling1.4.6 Management

A caster jack prototype, used to move stacks of extrusions onto trucks and about the assembly area, is being developed at the University of Minnesota. An updated design is undergoing an engineering stress analysis. Once the analysis is completed a new set of caster jacks will be produced.

1.4.6 Management

The Monthly Progress report, Schedule Turnaround report, and a EVMS variance report were submitted.

WBS 1.5 PVC Modules

(K. Heller/ D. Hennessy)

1.5.1 Requirements

No Change this month.

1.5.2 End Seal R&D

A sample manifold was received from PMC (Plastic Molded Concepts). Minor defects were noted (small number of burn marks present). The sample piece is within tolerances for the PVC extrusions. Injection port holes on the manifold need to be moved since currently they are located on a surface that will be sealed with glue.

1.5.3 Photo Detector Interface R&D

No Change this month.

1.5.4 Module Factory R&D

We began specifying a glue robot for the end seals.

A fourth generation of bubblers was designed with a smaller pressure head which should provide quicker response to leaks.

1.5.5 Quality Assurance and Quality Control Methods Development

We started new series of Compton scattering measurements on scintillator. This checks whether the fast (5-minute) epoxy that will be used to seal optical connector degrades the scintillator.

We began testing a new high-flow PVC resin to see whether the scintillator is degraded upon exposure to the resin.

1.5.6 Module shipping and storage R&D

No change during this month.

1.5.7 Integration Prototype Detector Modules

We continued readiness preparation for IPND production.

1.5.8 Initial Production Module Specifications

1.5.9 Initial Factory Tooling Specifications

1.5.10 Management - R&D Phase

No change during this month.

WBS 1.6 Electronics

(L. Mualem)

1.6.1 APD Module

Ordering of APD Arrays from Hamamatsu continued. Hamamatsu had delayed answer as to when additional components (bias resistor chain and connectors) are mounted on the carrier board. Hamamatsu engineers finally decided that this should be done before mounting the APD arrays. They therefore needed a component list from us to determine what work is needed and to quote the production of the modules. This work was finally completed and we are now awaiting the final quote for production.

Quantum efficiency tests of the previous production APD arrays are now complete. Documentation of the results will be forthcoming.

Additional documentation of the water cooling system is also underway. It is hoped that this will be suitable for a more complete review.

Production of additional components for the APD modules started at IU. Quotes for components are coming in and they are so-far in line with what was expected.

Additional design effort on the air cooling of TECs continued and is nearing a completed design. This will allow evaluation of the possible future of this technique as quotes for production could be obtained. It appears that the TECC designed by IU will be able to drive the modified TEC stack that would be used for the air-cooled system. This would reduce the number of changes that might be needed if the baseline design is changed.

1.6.2 Front End Board

Completed FEB3 prototypes were received in January. This month the interface board that will be used to talk to the devices over USB was produced. Effort is expected to ramp up on this project next month.

1.6.3 Power Distribution

The boards for the Power Distribution Box are still being produced and assembled.

A layout of the proposed IPND layout for power and cooling water distribution was produced for comment by the installation group.

1.6.4 Management - R&D Phase

No change since the last report.

1.6.5 Vertical Slice Tests

No change since the last report.

WBS 1.7 Data Acquisition

(L. Mualem)

1.7.1 DAQ Software

Efforts in DAQ software have started again. A survey of existing requirements documents was completed and a plan for completion of the missing documents that would be required for a review of the DAQ software system was outlined. Effort to understand the existing code and work toward getting a functional system has started on two fronts. The event builder software has been resurrected and is under study to determine what components are missing and what the plan forward will be.

In addition, the DAQ test stand which was abandoned a year ago has been resurrected and is once again able to communicate with at prototype DCM. The prototype DCM has been resurrected as well, and is now able to start-up, load its software from the network and begin communicating. There is still a lack of error-free communication between the processor and FPGA areas of the DCM, but this is now under investigation again.

1.7.2 DAQ Hardware

Effort on the hardware devices has resumed as well. The finalization of the DCM designs for IPND is underway. The changes to the timing system have also started. The simplified system will require some board modifications before the rest of the prototype components can be produced. Procurement of components can proceed in parallel with these changes.

1.7.3 Detector Control

1.7.4 Detector Control System

1.7.5 Management - R&D Phase

No progress this month.

WBS 1.8 Detector Assembly

(P. Lukens)

1.8.1. Plane Assembly Adhesive
1.8.2. Structural Design Validation
1.8.3. Liquid Scintillator Filling and Handling
1.8.4. Near Detector Assembly

No change this month.

1.8.5. Integration Prototype Near Detector (IPND)

During February, planning continued for the resumption of IPND work in the next few months. The collection, documentation and validation of electrical power requirements for the IPND electronics and DAQ systems continued. Discussions with FESS occurred to better specify the needs of the detector enclosure, including a discussion about adding 2 additional IPND blocks to the current installation plan so that the IPND would nearly identical to a complete Near Detector.

1.8.6. Far Detector Assembly Engineering

Argonne engineers continued work on the vacuum lifting fixture in February. They worked on an investigation of alternative of vacuum cups that is easier and faster to align than those used to date. **Reliable operation of the lifting fixture was demonstrated, and a safety review allowing operation over the entire ANL building 366 floor, while carrying an extrusion load, was successfully passed.**

The fire protection system for the adhesive dispenser was received.

1.8.7. Far Detector Installation Procedures

Although this activity has been formally completed, some installation planning work continued under WBS 1.8.9 during February. Review of FESS drawings of the Ash River civil construction continued. Another round of comments was returned to the architects of the Far Detector building.

Based on results from the vacuum lifting fixture tests, updated estimates of time-and-motion studies for module handling were made, and found to be in line with the baseline estimates for the full assembly schedule.

1.8.8. Far Detector Prototypes

During February, the scintillator leak test in the CZero building elevator-shaft enclosure was monitored.

Work on the Full Scale Assembly Prototype (FSAP) consisted of preparation of the vacuum lifter and adhesive dispenser, described above under WBS 1.8.6.

1.8.9. Management

During February, the Level 2 and Level 3 detector assembly managers participated actively in most of the WBS 1.8 technical work described elsewhere in this section.

WBS 1.9 & 2.10 Project Management

(J. Cooper)

1.9 Project Management – R&D
This set of WBS items is complete.

2.10 Project Management – Final Design & Construction

2.10.2 FY08

One **NOvA Technical Board** meeting was held on February 17. The main part of the meeting was devoted to EVMS training of CAMs.

A **NOvA Project Management Group** meeting was held on February 17. The talks presented and minutes of the meeting are available in NOVA-doc-3523(v6).

Now that the project has re-started and the full EVMS reporting is in process, the next step is to do the full reporting cycle more quickly. The Project Office has established a schedule for all the reporting input for each month and in November began to push each Level 2 Manager, each CAM, and Project Controls to execute the cycle within the allotted month. In the established schedule, these monthly reports should appear on the 20th working day of the following month. This month's report realizes that goal.

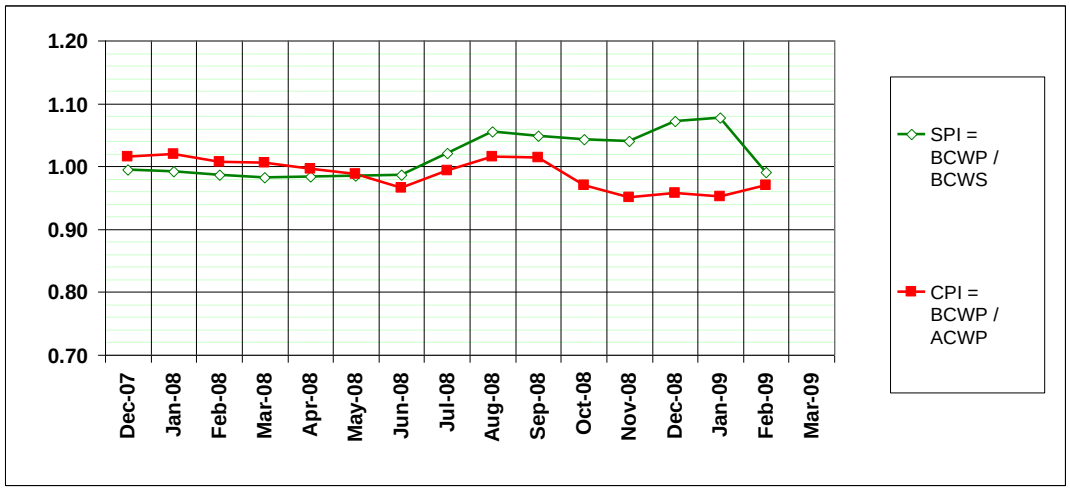
EVMS Summary

(S. Saxer, W. Freeman, H. Ferguson, E. McCluskey)

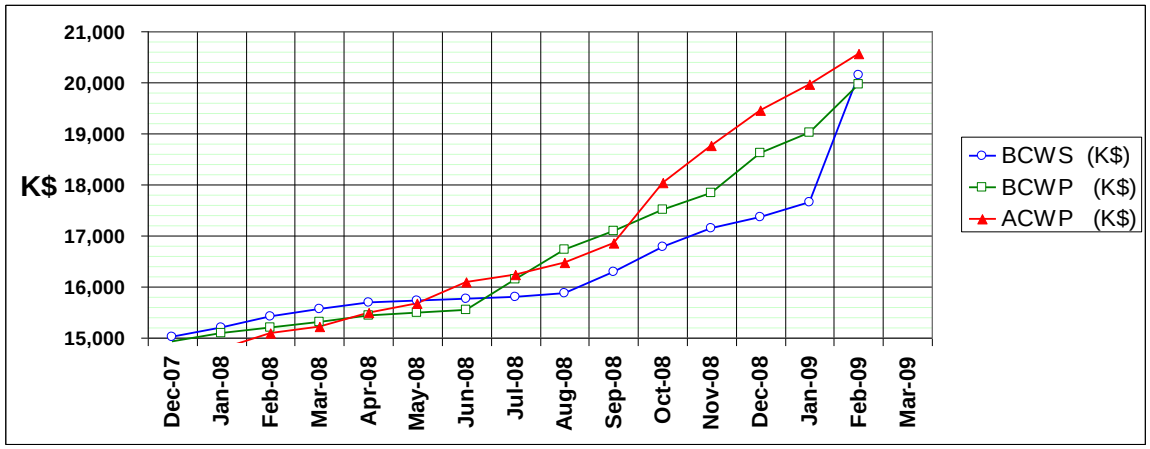
This monthly report focuses on the EVMS status relative to the baselined RLS as reviewed by DOE (Lehman) on April 30, 2008 and approved (CD-2) by Ray Orbach on September 15, 2008.

CPI and SPI curves.

As discussed in the Overview section of this report, the Schedule Performance Index moved from 1.08 in January to 0.99 in February. This reflects the fact that in February real time crossed into the part of the NOvA schedule to which all tasks had been delayed to compensate for the FY08 Omnibus Bill action. Effectively, the project did manage to work ahead of schedule from July through January once funding was restored by the FY08 Supplementary Funding Bill and the FY09 Continuing Resolution, but that schedule advantage has disappeared as we crossed into the delayed tasks.



BCWS, BCWP, ACWP History.



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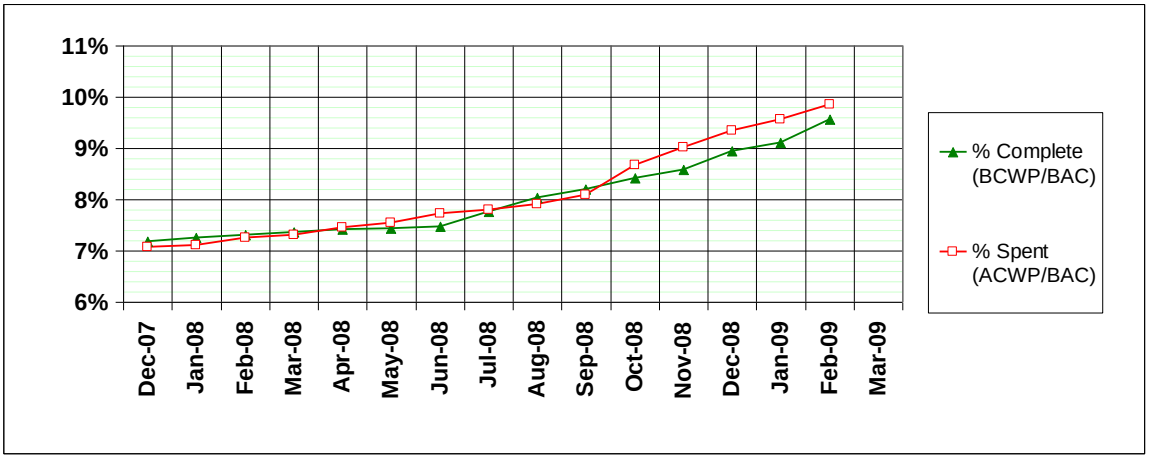

Baseline Change Control Log Actions

The NOvA Project Management Group serves as the highest level change control board. During February, two NOvA changes were approved by the NOvA Project Manager.

In addition, CR# 57 was approved by the Associate Director for Research and by the Federal Project Director since the project had crossed the cumulative change dollar threshold for the Associate Director and was quite close to the cumulative change dollar threshold for the Federal Project Director. We elected to keep the two approvals together for easy in tracking a new cumulative sum once CR#57 was approved.

CR Log Query for Monthly Report

CR #	Affected WBS #'s	CO Title	Date:	Level of Change	Final Cost Impact	Final Schedule Impact	Status
60	2.0.2.2.2.1.1.1 - 2.0.2.2.2.1.1.4, 2.0.2.2.2.1.2.1 - 2.0.2.2.2.1.2.4, 2.0.2.2.2.1.3.1 - 2.0.2.2.2.1.3.4, 2.0.2.2.2.1.4.1 - 2.0.2.2.2.1.4.4	MI RF Cavities Baseline Date Adjustments	3/2/2009	L4 (NOVA PM)	$22,078.65	none	Approved by PM
58	1.3.5.2	IPND Fiber QA Labor Adjustment	2/18/2009	L4 (NOVA PM)	$42,305.02		Approved by PM
57	various - see spreadsheet	Cumulative Change Request A	2/17/2009	L2 (DOE Fermi)	$0.00		Approved by DOE FPD
				Total Contingency Use this Month	$64,383.67		

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WBS Level 2 Contract Performance Report

COST PERFORMANCE REPORT FORMAT 1 - WORK BREAKDOWN STRUCTURE													
CONTRACTOR					CONTRACT			PROGRAM			4. REPORT PERIOD		
NAME Fermi National Accelerator Laboratory					NAME			NAME NOvA Project			FROM 01-Feb-2009 TO 28-Feb-2009		
PERFORMANCE DATA													
Fund Source WBS[2] Results...	CURRENT PERIOD					CUMULATIVE TO DATE					AT COMPLETION		
	BUDGETED COST		ACTUAL COST	VARIANCE		BUDGETED COST		ACTUAL COST	VARIANCE			LATEST	
ITEM	WORK SCHEDULED	WORK PERFORMED	WORK PERFORMED	SCHEDULE	COST	WORK SCHEDULED	WORK PERFORMED	WORK PERFORMED	SCHEDULE	COST	BUDGETED	REVISED ESTIMATE	VARIANCE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
DA DOE-ACEL MIE													
2.0 ANU Construction													
Fully Burdened AY$k	386	98	57	(288)	41	593	322	283	(271)	39	29,946	29,943	2
Fund SourceTotals:	386	98	57	(288)	41	593	322	283	(271)	39	29,946	29,943	2
DC DOE-CA													
2.1 Site and Building													
Fully Burdened AY$k	55	376	46	321	330	351	1,278	958	927	320	46,239	46,075	164
Fund SourceTotals:	55	376	46	321	330	351	1,278	958	927	320	46,239	46,075	164
DD DOE-ACEL R&D													
1.0 ANU R&D													
Fully Burdened AY$k	598	146	144	(451)	2	1,998	2,222	2,033	224	189	7,604	7,406	198
Fund SourceTotals:	598	146	144	(451)	2	1,998	2,222	2,033	224	189	7,604	7,406	198
DE DOE-DET MIE													
2.1 Site and Building													
Fully Burdened AY$k	58	58	0	0	58	145	145	0	0	145	2,296	2,108	188
2.10 Project Management - Nova Project - Construction													
Fully Burdened AY$k	62	62	55	0	7	730	730	589	0	141	5,562	5,393	168
2.2 Liquid Scintillator													
Fully Burdened AY$k	5	5	0	0	5	5	5	0	0	5	18,516	18,511	5
2.3 WLS Fiber													
Fully Burdened AY$k	1	1	0	0	1	1	1	0	0	1	10,081	10,107	(26)
2.4 PVC Extrusions													
Fully Burdened AY$k	80	1	0	(79)	1	80	1	0	(79)	1	25,276	25,265	11
2.5 PVC Modules													
Fully Burdened AY$k	12	12	0	0	12	61	61	0	0	61	10,306	10,249	57
2.6 Electronics													
Fully Burdened AY$k	1	1	0	0	1	1	1	0	0	1	11,843	11,845	(2)
2.7 DAQ													
Fully Burdened AY$k	0	0	0	0	0	0	0	0	0	0	3,532	3,532	0
2.8 Near Detector Assembly													
Fully Burdened AY$k	27	6	46	(21)	(40)	27	68	46	41	21	4,249	4,214	35
2.9 Far Detector Assembly													
Fully Burdened AY$k	120	8	0	(112)	8	157	45	5	(112)	40	11,406	11,322	84
Fund SourceTotals:	367	156	102	(211)	54	1,207	1,058	640	(150)	418	103,067	102,547	521
DO DOE-ACEL OPS													
1.0 ANU R&D													
Fully Burdened AY$k	149	19	28	(130)	(9)	229	233	57	5	177	1,227	1,047	180
Fund SourceTotals:	149	19	28	(130)	(9)	229	233	57	5	177	1,227	1,047	180
DR DOE-POST CD-1 DET R&D													
1.1 Site and Building R&D													
Fully Burdened AY$k	0	0	40	0	(40)	2,275	2,275	1,666	0	608	2,275	1,666	608
1.2 Liquid Scintillator R&D													
Fully Burdened AY$k	12	4	2	(8)	2	264	256	211	(8)	45	271	226	45
1.3 WLS Fiber R&D													
Fully Burdened AY$k	25	87	101	62	(14)	172	234	261	62	(27)	341	368	(27)
1.4 PVC Extrusion R&D													
Fully Burdened AY$k	81	0	20	(81)	(20)	1,007	938	975	(69)	(37)	1,348	1,389	(41)
1.5 PVC Module R&D													
Fully Burdened AY$k	287	25	0	(262)	25	829	550	1,041	(279)	(491)	1,590	2,086	(496)
1.6 Electronics R&D													
Fully Burdened AY$k	156	19	14	(136)	5	429	313	550	(116)	(237)	1,473	1,718	(245)
1.7 DAQ R&D													
Fully Burdened AY$k	125	2	18	(123)	(16)	339	218	798	(121)	(580)	1,384	1,954	(570)
1.8 Detector Assembly R&D													
Fully Burdened AY$k	260	13	36	(247)	(23)	1,271	879	1,733	(392)	(854)	2,851	3,708	(857)
1.9 Project Management R&D													
Fully Burdened AY$k	0	0	0	0	0	383	383	559	0	(176)	383	559	(176)
Fund SourceTotals:	946	151	232	(795)	(81)	6,969	6,046	7,795	(923)	(1,748)	11,916	13,674	(1,758)
DY DOE CD-0 TO CD-1 R&D													
1.9 Project Management R&D													
Fully Burdened AY$k	0	0	0	0	0	8,801	8,801	8,801	0	0	8,801	8,801	0
Fund SourceTotals:	0	0	0	0	0	8,801	8,801	8,801	0	0	8,801	8,801	0
Undist. Budget											0	0	0
Sub Total	2,501	947	609	(1,554)	338	20,147	19,959	20,565	(188)	(606)	208,800	209,493	(693)
Management Resrv.											69,200		
Total	2,501	947	609	(1,554)	338	20,147	19,959	20,565	(188)	(606)	278,000		

Variance Summary for NOvA Control Accounts at WBS Level 2

The NOvA Control Accounts have been rolled up to WBS Level 2 in this report to match the Level 2 Contract Performance Report 1 on the previous page. The table below summarizes the status.

The FRA EVMS required reporting thresholds to DOE at WBS Level 2 are:

- Green: SV or CV < 5%
- Yellow: SV or CV in the range ≥ 5% but < 10% and the SV or CV is ≥125 K$
- Red: SV or CV in the range ≥ 10% and the SV or CV is ≥ 250 K$

At the Control Account Level, the green/yellow/red bands have the same % thresholds, but the $ thresholds are changed to 50 K$ for the yellow and to 100 K$ for the Red. Red requires a written variance analysis at the Control Account level.

Report Period: Feb-09															
	Current Period							Cumulative						
WBS Level 2	BCWS (AY$)	BCWP (AY$)	ACWP (AY$)	SV (AY$)	SV (%)	CV (AY$)	CV (%)	BCWS (AY$)	BCWP (AY$)	ACWP (AY$)	SV (AY$)	SV (%)	CV (AY$)	CV (%)
R&D														
1.0 ANU R&D	746,760	165,162	171,744	-581,598	-78%	-6,582	-4%	2,226,404	2,454,958	2,089,211	228,553	10%	365,747	15%
1.1 Site and Building R&D	0	0	40,234	0	0%	-40,234	-100%	2,274,519	2,274,519	1,666,483	0	0%	608,036	27%
1.2 Liquid Scintillator R&D	11,940	4,221	2,246	-7,719	-65%	1,976	47%	263,858	256,164	211,138	-7,694	-3%	45,025	18%
1.3 WLS Fiber R&D	25,303	87,109	100,942	61,807	244%	-13,833	-16%	172,208	234,014	260,922	61,807	36%	-26,907	-11%
1.4 PVC Extrusion R&D	81,085	0	19,829	-81,085	-100%	-19,829	-100%	1,006,723	938,211	974,916	-68,512	-7%	-36,705	-4%
1.5 PVC Module R&D	286,736	25,200	0	-261,535	-91%	25,200	100%	829,196	550,292	1,041,055	-278,904	-34%	-490,763	-89%
1.6 Electronics R&D	155,840	19,443	14,471	-136,397	-88%	4,972	26%	429,049	313,030	549,846	-116,019	-27%	-236,816	-76%
1.7 DAQ R&D	125,175	1,747	17,983	-123,429	-99%	-16,236	-930%	339,419	218,044	798,136	-121,375	-36%	-580,092	-266%
1.8 Detector Assembly R&D	260,125	13,117	36,482	-247,007	-95%	-23,365	-178%	1,270,768	878,966	1,733,144	-391,802	-31%	-854,178	-97%
1.9 Project Management R&D	0	0	0	0	0%	0	0%	9,184,127	9,184,127	9,359,785	0	0%	-175,658	-2%
Construction														
2.0 ANU Construction	386,295	98,499	57,038	-287,795	-75%	41,461	42%	592,845	322,027	282,894	-270,818	-46%	39,133	12%
2.1 Site and Building	113,241	434,661	46,000	321,419	284%	388,661	89%	495,884	1,422,747	957,617	926,863	187%	465,131	33%
2.10 Project Management - Nova Project - Constru	61,975	61,975	55,200	0	0%	6,775	11%	730,227	730,227	588,898	0	0%	141,330	19%
2.2 Liquid Scintillator	5,211	5,211	0	0	0%	5,211	100%	5,211	5,211	0	0	0%	5,211	100%
2.3 WLS Fiber	863	863	0	0	0%	863	100%	863	863	0	0	0%	863	100%
2.4 PVC Extrusions	79,933	1,402	0	-78,531	-98%	1,402	100%	79,933	1,402	0	-78,531	-98%	1,402	100%
2.5 PVC Modules	12,092	12,092	0	0	0%	12,092	100%	61,067	61,067	0	0	0%	61,067	100%
2.6 Electronics	751	751	0	0	0%	751	100%	751	751	0	0	0%	751	100%
2.7 DAQ	213	213	0	0	0%	213	100%	213	213	0	0	0%	213	100%
2.8 Near Detector Assembly	27,150	6,410	46,427	-20,740	-76%	-40,017	-624%	27,150	67,652	46,427	40,501	149%	21,224	31%
2.9 Far Detector Assembly	120,229	8,492	0	-111,737	-93%	8,492	100%	156,651	44,915	4,692	-111,737	-71%	40,223	90%
R&D SubTotal (WBS 1.0-1.9)	1,692,963	315,999	403,930	-1,376,964	-81%	-87,931	-28%	17,996,272	17,302,324	18,684,636	-693,947	-4%	-1,382,312	-8%
Construction SubTotal (WBS 2.0-2	807,954	630,570	204,665	-177,384	-22%	425,905	68%	2,150,797	2,657,075	1,880,528	506,278	24%	776,548	29%
Project Total	2,500,917	946,569	608,595	-1,554,348	-62%	337,974	36%	20,147,069	19,959,400	20,565,164	-187,669	-1%	-605,764	-3%

In the overall project roll-up (see bottom line in the table), the project is within tolerance on the Cumulative SV and CV. The project started up early following the FY08 Supplementary Appropriation in July 2008, but in February 2009 crossed into the baseline schedule where tasks had been delayed following instructions from DOE. Our cumulative schedule variance SV moved from + 8% in January to -1% in February as many of the February tasks were not completed as scheduled. Our cumulative Cost variance CV improved from -5% in January to -3% in February.

The Construction roll-up (second line from the bottom) shows an overall project summary with the Cumulative SV and CV in the red and Current Month CV in the red. In both cases these are positive variances, but only on about $ 2.2 M of Construction

effort to date. Most of the work has been on final designs in preparation for a CD-3b IPR, but in February a few CD-3a tasks were begun and now all the WBS Level 2 Construction tasks are active (half were still inactive in January). The Current Month SV is negative, reflecting tasks which should have been accomplished as we crossed into the tasks delayed to February 2009.

The R&D roll-up (third line from the bottom) shows an overall project summary with Cumulative SV in the green (-1%) and Cumulative CV in the yellow (-8%). For about $ 17 M of BCWP on R&D to date, the R&D is costing more than planned due primarily to technical problems in the Detector Assembly WBS 1.8. The Current Month R&D SV is negative, reflecting tasks which should have been accomplished as we crossed into February 2009 delayed tasks.

In February, 35 of the 68 NOvA Control Accounts were active with scheduled work, performed work, or actual costs in the cumulative view. 11 of the active Control Accounts required a written variance analysis in January. These were written by the CAMs and approved by the Project Manager.

The largest (positive or negative) cumulative variances and their explanations as extracted from the February Variance Analysis Reports are as follows:

Largest few Cumulative SVs:

- 2.1.2 Far Detector Building SV = +960 K$ on 96 K$ of BCWS
  This SV increased from +623K$ to +960K$ between January and February.
  Work was started in October 2008 using FY07 carryover funds as a Project Manager sanctioned strategy to advance this critical path item. Since this is a Level of Effort task, there is little BCWS or BCWP until the task starts in the baseline schedule in February. The tasks have now started, but even more work was accomplished due to the final push to get a biddable design ready for distribution.

- 1.0.3 NuMI Upgrades SV = +577 K$ on 412 K$ of BCWS
  This SV decreased from +577K$ to +360K$ between January and February.
  Scheduled work in February was 239K$, work performed was only 21K$ because most of the work was done earlier than February.
  The work for 1.0.3 is ahead of schedule because funding and resources became available before the start dates in the project baseline. Beginning work early helps mitigate NOvA risk #95 (see Nova docdb 2841) which is the potential lack of Accelerator Division personnel.

- 1.8 Detector Assembly R&D SV = -145 K$ on 1,271 K$ of BCWS
  This SV got worse from -145K$ to -391K$ between January and February.
  The variance is largely due to the fact that technical issues with the Vacuum Lifting Fixture were finally solved in February after months of effort. Technical issues with the Adhesive Dispenser remain unresolved.

Largest few Cumulative CVs:

- 1.1 Site & Building R&D CV = +577 K$ on 2,275 K$ of BCWP

  This CV changed from +577K$ to +345K$ between January and February.

  This work is nearly complete as the final drawings are almost ready for the bid process.

- 1.0.3 NuMI Upgrades CV = +345 K$ on 771 K$ of BCWP

  This CV changed from +187K$ to +345K$ between January and February.

  The positive cost variance has been steadily growing and continues to look like a systematic over estimate of the manpower needed to complete the tasks. An ETC change is contemplated.

- 1.7 DAQ R&D CV = -580 K$ on 218 K$ of BCWP

  This CV changed from -564K$ to -580K$ between January and February.

  The DAQ hardware has required more debugging than anticipated. The initial version of the device was more complicated than originally anticipated. Some of this variance may be reclaimed in that there will be less development needed since the hardware has a more standard interface rather than a custom implementation.

  The DAQ software variance is appears to be spread over all tasks, and is still under investigation for a complete accounting as a new team assesses the work left to be accomplished.

- 1.8 Detector Assembly R&D CV = -845 K$ on 879 K$ of BCWP

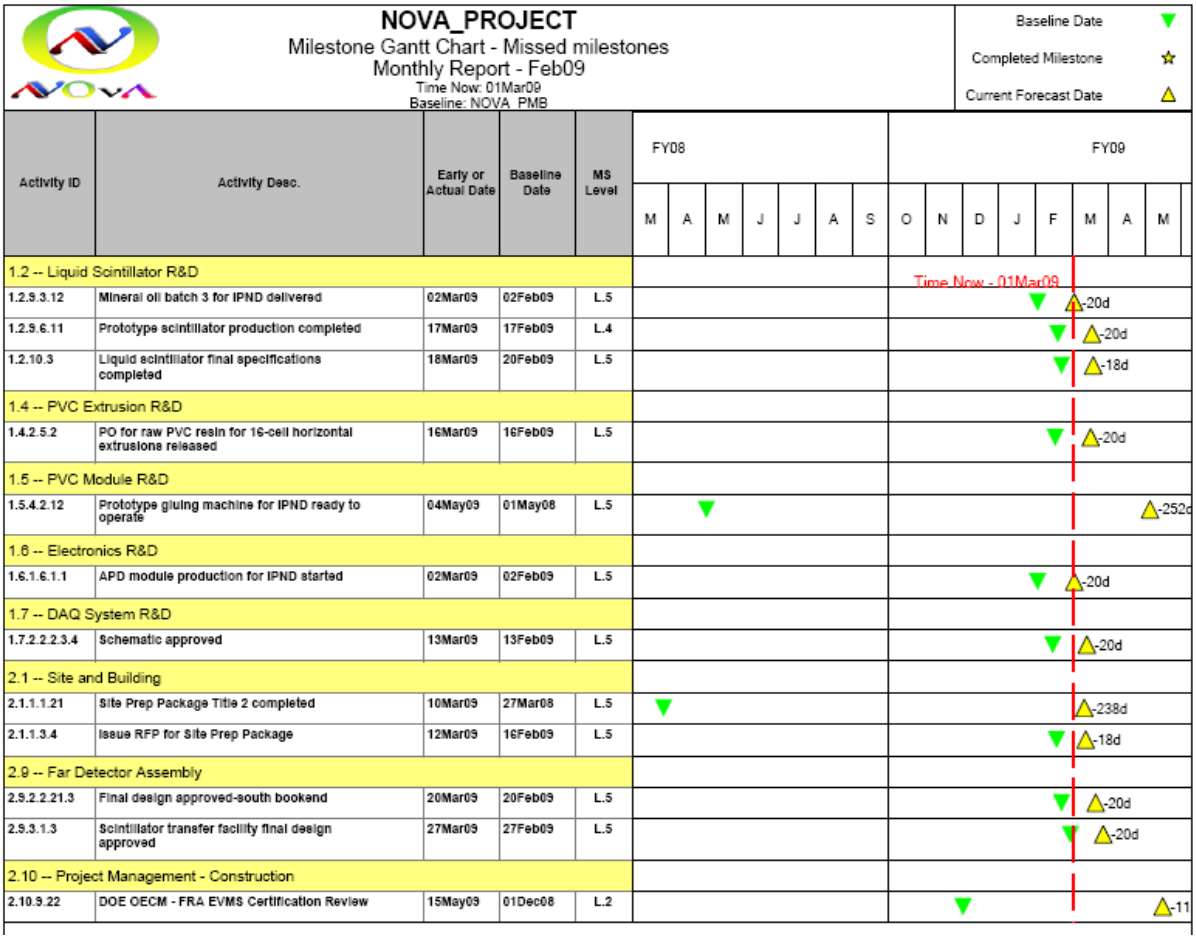
  This CV changed from -831K$ to -854K$ between January and February.

  The cumulative cost variance is largely due to the fact that several technical issues with the detector assembly remained unresolved as discussed above in the SV variance summary.

Milestone Analysis

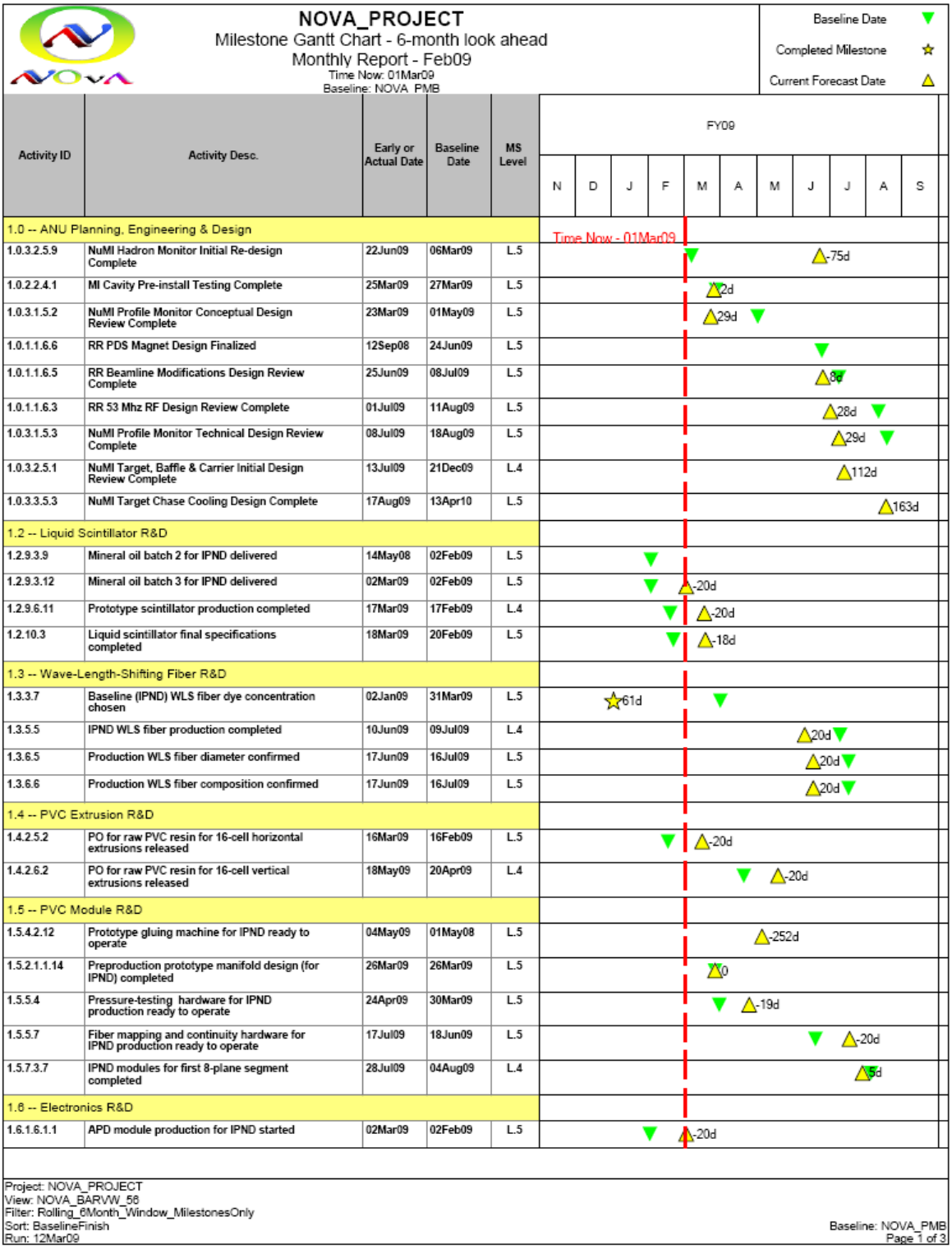
Milestones completed this month: 0
Milestones which should be complete by now but are not yet completed: 12

The list of missed milestones is shown below. Nine new milestones were missed in February, reflecting uncompleted tasks that the project had moved to February 2009 following the budget crisis caused by the FY08 Omnibus Bill. This list was discussed by the Project Manager with the Level 2 Managers and CAMs, and it looks as though about half of these missed milestones should be completed during the next month or so.



Activity ID	Activity Desc.	Early or Actual Date	Baseline Date	MS Level
1.2 -- Liquid Scintillator R&D				
1.2.9.3.12	Mineral oil batch 3 for IPND delivered	02Mar09	02Feb09	L5
1.2.9.6.11	Prototype scintillator production completed	17Mar09	17Feb09	L4
1.2.10.3	Liquid scintillator final specifications completed	18Mar09	20Feb09	L5
1.4 -- PVC Extrusion R&D				
1.4.2.5.2	PO for raw PVC resin for 16-cell horizontal extrusions released	16Mar09	16Feb09	L5
1.5 -- PVC Module R&D				
1.5.4.2.12	Prototype gluing machine for IPND ready to operate	04May09	01May08	L5
1.6 -- Electronics R&D				
1.6.1.6.1.1	APD module production for IPND started	02Mar09	02Feb09	L5
1.7 -- DAQ System R&D				
1.7.2.2.2.3.4	Schematic approved	13Mar09	13Feb09	L5
2.1 -- Site and Building				
2.1.1.1.21	Site Prep Package Title 2 completed	10Mar09	27Mar08	L5
2.1.1.3.4	Issue RFP for Site Prep Package	12Mar09	16Feb09	L5
2.9 -- Far Detector Assembly				
2.9.2.2.21.3	Final design approved-south bookend	20Mar09	20Feb09	L5
2.9.3.1.3	Scintillator transfer facility final design approved	27Mar09	27Feb09	L5
2.10 -- Project Management - Construction				
2.10.9.22	DOE OECM - FRA EVMS Certification Review	15May09	01Dec08	L2

Here is the usual NOvA summary of milestones scheduled during the last few months with a six month look ahead to the future. The pace of scheduled milestones has increased, so the next few months present a challenge to increase the pace of completed effort throughout the project.



NOVA_PROJECT
Milestone Gantt Chart - 6-month look ahead
Monthly Report - Feb09
Time Now: 01Mar09
Baseline: NOVA_PMB

Baseline Date
Completed Milestone
Current Forecast Date

Activity ID	Activity Desc.	Early or Actual Date	Baseline Date	MS Level
1.0 -- ANU Planning, Engineering & Design				
1.0.3.2.5.9	NuMI Hadron Monitor Initial Re-design Complete	22Jun09	06Mar09	L5
1.0.2.2.4.1	MI Cavity Pre-install Testing Complete	25Mar09	27Mar09	L5
1.0.3.1.5.2	NuMI Profile Monitor Conceptual Design Review Complete	23Mar09	01May09	L5
1.0.1.1.6.6	RR PDS Magnet Design Finalized	12Sep08	24Jun09	L5
1.0.1.1.6.5	RR Beamline Modifications Design Review Complete	25Jun09	08Jul09	L5
1.0.1.1.6.3	RR 53 Mhz RF Design Review Complete	01Jul09	11Aug09	L5
1.0.3.1.5.3	NuMI Profile Monitor Technical Design Review Complete	08Jul09	18Aug09	L5
1.0.3.2.5.1	NuMI Target, Baffle & Carrier Initial Design Review Complete	13Jul09	21Dec09	L4
1.0.3.3.5.3	NuMI Target Chase Cooling Design Complete	17Aug09	13Apr10	L5
1.2 -- Liquid Scintillator R&D				
1.2.9.3.9	Mineral oil batch 2 for IPND delivered	14May08	02Feb09	L5
1.2.9.3.12	Mineral oil batch 3 for IPND delivered	02Mar09	02Feb09	L5
1.2.9.6.11	Prototype scintillator production completed	17Mar09	17Feb09	L4
1.2.10.3	Liquid scintillator final specifications completed	18Mar09	20Feb09	L5
1.3 -- Wave-Length-Shifting Fiber R&D				
1.3.3.7	Baseline (IPND) WLS fiber dye concentration chosen	02Jan09	31Mar09	L5
1.3.5.5	IPND WLS fiber production completed	10Jun09	09Jul09	L4
1.3.6.5	Production WLS fiber diameter confirmed	17Jun09	16Jul09	L5
1.3.6.6	Production WLS fiber composition confirmed	17Jun09	16Jul09	L5
1.4 -- PVC Extrusion R&D				
1.4.2.5.2	PO for raw PVC resin for 16-cell horizontal extrusions released	16Mar09	16Feb09	L5
1.4.2.6.2	PO for raw PVC resin for 16-cell vertical extrusions released	18May09	20Apr09	L4
1.5 -- PVC Module R&D				
1.5.4.2.12	Prototype gluing machine for IPND ready to operate	04May09	01May08	L5
1.5.2.1.1.14	Preproduction prototype manifold design (for IPND) completed	26Mar09	26Mar09	L5
1.5.5.4	Pressure-testing hardware for IPND production ready to operate	24Apr09	30Mar09	L5
1.5.5.7	Fiber mapping and continuity hardware for IPND production ready to operate	17Jul09	18Jun09	L5
1.5.7.3.7	IPND modules for first 8-plane segment completed	28Jul09	04Aug09	L4
1.6 -- Electronics R&D				
1.6.1.6.1.1	APD module production for IPND started	02Mar09	02Feb09	L5

FY09: N D J F M A M J J A S

Time Now - 01Mar09

-75d
2d
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8d
28d
29d
112d
163d
-20d
-20d
-18d
61d
20d
20d
20d
-20d
-20d
-252d
0
-19d
-20d
5d
-20d

Project: NOVA_PROJECT
View: NOVA_BARVW_56
Filter: Rolling_6Month_Window_MilestonesOnly
Sort: BaselineFinish
Run: 12Mar09

Baseline: NOVA_PMB
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NOVA_PROJECT

Milestone Gantt Chart - 6-month look ahead

Monthly Report - Feb09

Time Now: 01Mar09

Baseline: NOVA_PMB

Baseline Date ▼

Completed Milestone ☆

Current Forecast Date △

Activity ID	Activity Desc.	Early or Actual Date	Baseline Date	MS Level
1.6.2.4.12	FEB prototype III released to DAQ	29May09	16Jun09	L.5
1.6.2.5.1	FEB modules for IPND started	24Jul09	29Jun09	L.5
1.6.1.2.8	QA/QC station ready	17Aug09	20Jul09	L.5
1.6.1.6.1.7	APD modules for 8-plane segment completed	24Aug09	27Jul09	L.5
1.7 -- DAQ System R&D				
1.7.2.2.2.3.4	Schematic approved	13Mar09	13Feb09	L.5
1.7.1.4.4.7	Run control system for software first release	31Mar09	03Mar09	L.5
1.7.2.3.1.3	Requirements approved	02Apr09	05Mar09	L.5
1.7.2.2.3.3	PCB manufacturing approved	08Apr09	11Mar09	L.5
1.7.1.6.4.1.6	Event buffer farm server for software first release	13Apr09	16Mar09	L.5
1.7.2.3.4	Evaluation components received	30Apr09	02Apr09	L.5
1.7.1.6.3.1.13	Event buffer farm core software for software first release	04May09	06Apr09	L.5
1.7.2.1.6.2	IPND data concentrator PCBs and components received	11May09	14Apr09	L.5
1.7.1.8.3.6	Global trigger system for software first release	11Jun09	13May09	L.5
1.7.2.2.3.5	Prototype PCBs and components received for control and timing system	11Jun09	20May09	L.5
1.7.2.4.1.3	Requirements approved	06Jul09	05Jun09	L.5
1.7.4.11	Detector control system released	13Jul09	12Jun09	L.5
1.7.2.4.3	Evaluation components received	03Aug09	06Jul09	L.5
1.7.1.8.4.8	Global trigger system for software second release	12Aug09	15Jul09	L.5
1.7.1.11	DAQ software ready for IPND	12Aug09	15Jul09	L.4
1.7.2.1.8	IPND data concentrators ready for installation	18Sep09	21Aug09	L.4
1.7.2.2.4.4	Control and timing prototype tests completed	21Sep09	28Aug09	L.5
1.8 -- Detector Assembly R&D				
1.8.5.2.12	IPND systems designs completed	19May09	21Apr09	L.5
1.8.6.4	30% design of far detector mechanical systems and tooling completed	27May09	28Apr09	L.5
1.8.8.2.6	Select site for block installation at FNAL	26May09	05May09	L.5
1.8.5.4.5	IPND block assembly facility completed	10Jul09	11Jun09	L.6
1.8.5.6.1.4	Notice to proceed on Phase 1 of IPND infrastructure in MSB	17Jul09	18Jun09	L.6
1.8.5.6.2.4	Notice to proceed - Phase 1 of IPND containment	31Jul09	02Jul09	L.6
1.8.8.1.13	Full-scale block assembly prototype testing completed	11Sep09	23Jul09	L.4
2.0 -- ANU Construction				

Project: NOVA_PROJECT
View: NOVA_BARVW_56
Filter: Rolling_6Month_Window_MilestonesOnly
Sort: BaselineFinish
Run: 12Mar09

Baseline: NOVA_PMB
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NOVA_PROJECT

Milestone Gantt Chart - 6-month look ahead

Monthly Report - Feb09

Time Now: 01Mar09

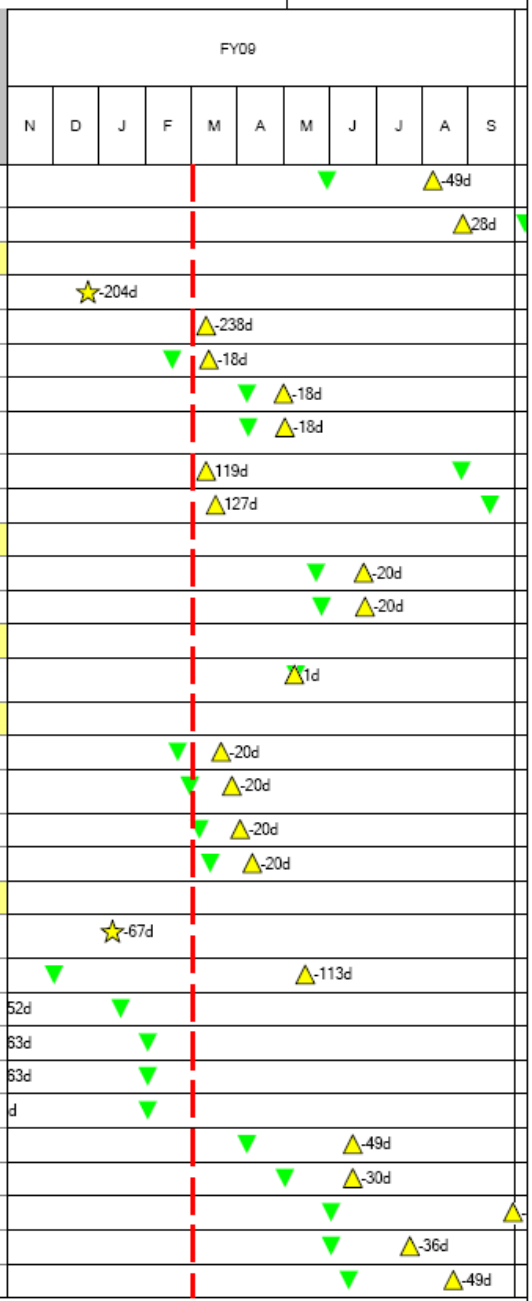
Baseline: NOVA_PMB

Baseline Date ▼

Completed Milestone ☆

Current Forecast Date △

Activity ID	Activity Desc.	Early or Actual Date	Baseline Date	MS Level
2.0.2.2.5.1	MI RF Cavities Bus Bar Fabrication & Installation Complete	07Aug09	29May09	L.4
2.0.1.1.5.3	RR Orders Placed for Copper for 53 Mhz RF	27Aug09	07Oct09	L.5
2.1 -- Site and Building				
2.1.1.2.6	Wetland permit issued	24Dec08	05Mar08	L.4
2.1.1.1.21	Site Prep Package Title 2 completed	10Mar09	27Mar08	L.5
2.1.1.3.4	Issue RFP for Site Prep Package	12Mar09	16Feb09	L.5
2.1.1.3.7	Site preparation purchase order released	30Apr09	06Apr09	L.2
2.1.1.4.1	Notice to proceed - far detector site preparation package	01May09	07Apr09	L.5
2.1.2.1.21	Far Detector Building Title 2 completed	10Mar09	26Aug09	L.5
2.1.2.2.4	Issue RFP for Far Detector Building	16Mar09	14Sep09	L.5
2.2 -- Liquid Scintillator				
2.2.3.4	Waveshifter PO issued	22Jun09	22May09	L.2
2.2.3.5.1	Waveshifter production and delivery begins	23Jun09	26May09	L.5
2.8 -- Near Detector Assembly				
2.8.1.1.6	Administrative and safety signoffs on near detector cavern excavation design	07May09	08May09	L.6
2.9 -- Far Detector Assembly				
2.9.2.2.21.3	Final design approved-south bookend	20Mar09	20Feb09	L.5
2.9.3.1.3	Scintillator transfer facility final design approved	27Mar09	27Feb09	L.5
2.9.1.1.3	Final design approved - module lifting fixture	02Apr09	05Mar09	L.5
2.9.2.2.22.3	Final design approved- north bookend	10Apr09	13Mar09	L.5
2.10 -- Project Management - Construction				
2.10.9.21	DOE OECM - FRA EVMS Readiness Assessment	09Jan09	01Oct08	L.2
2.10.9.22	DOE OECM - FRA EVMS Certification Review	15May09	01Dec08	L.2
2.10.9.20	DOE OHEP CD-3a Mini-review	24Oct08	15Jan09	L.2
2.10.8.1	CD-3a	24Oct08	02Feb09	L.1
2.10.9.5	CD-3a Funds Available	24Oct08	02Feb09	L.3
2.10.9.7	FY09 Funds Available	14Oct08	02Feb09	L.3
2.10.10.3	2009 Shutdown Begun	15Jun09	06Apr09	L.3
2.10.9.24	Director's CD-3b Review	15Jun09	01May09	L.3
2.10.9.23	DOE OECM - FRA EVMS Certified	29Sep09	01Jun09	L.2
2.10.9.25	DOE OHEP CD-3b Review	23Jul09	01Jun09	L.2
2.10.10.4	2009 Shutdown Completed	21Aug09	12Jun09	L.4



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View: NOVA_BARVW_56
Filter: Rolling_6Month_Window_MilestonesOnly
Sort: BaselineFinish
Run: 12Mar09

Baseline: NOVA_PMB
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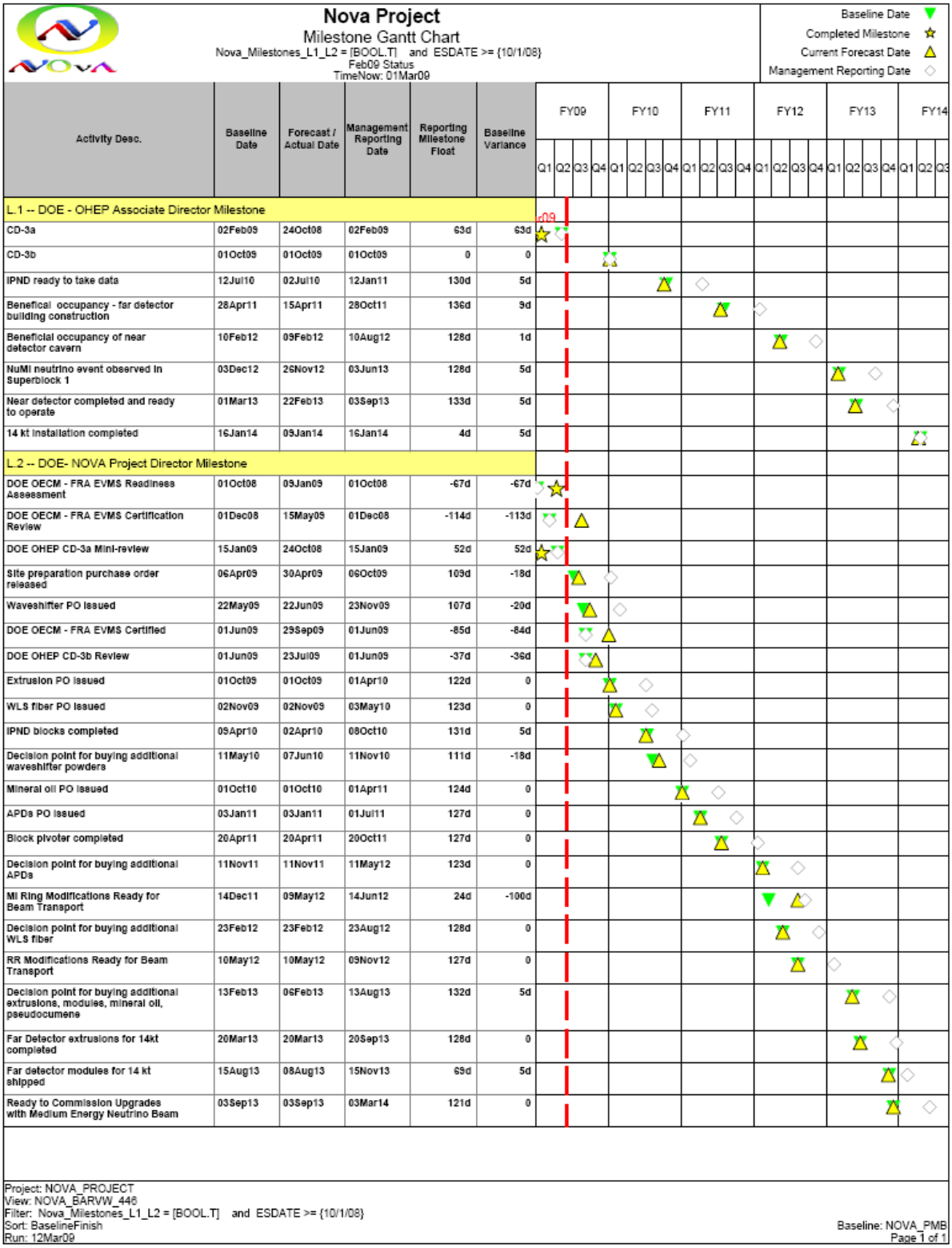
Milestone Analysis by Management Level

This looks ahead to all remaining L1 and L2 milestones in the project.



Nova Project
Milestone Gantt Chart
Nova_Milestones_L1_L2 = [BOOL.T] and ESDATE >= {10/1/08}
Feb09 Status
TimeNow: 01Mar09

Baseline Date
Completed Milestone
Current Forecast Date
Management Reporting Date

Activity Desc.	Baseline Date	Forecast / Actual Date	Management Reporting Date	Reporting Milestone Float	Baseline Variance
L.1 -- DOE - OHEP Associate Director Milestone					
CD-3a	02Feb09	24Oct08	02Feb09	63d	63d
CD-3b	01Oct09	01Oct09	01Oct09	0	0
IPND ready to take data	12Jul10	02Jul10	12Jan11	130d	5d
Benefical occupancy - far detector building conetruction	28Apr11	15Apr11	28Oct11	136d	9d
Beneficial occupancy of near detector cavern	10Feb12	09Feb12	10Aug12	128d	1d
NuMI neutrino event obeserved in Superblock 1	03Dec12	26Nov12	03Jun13	128d	5d
Near detector completed and ready to operate	01Mar13	22Feb13	03Sep13	133d	5d
14 kt installation completed	16Jan14	09Jan14	16Jan14	4d	5d
L.2 -- DOE- NOVA Project Director Milestone					
DOE OECM - FRA EVMS Readiness Assessment	01Oct08	09Jan09	01Oct08	-67d	-67d
DOE OECM - FRA EVMS Certification Review	01Dec08	15May09	01Dec08	-114d	-113d
DOE OHEP CD-3a Mini-review	15Jan09	24Oct08	15Jan09	52d	52d
Site preparation purchase order released	06Apr09	30Apr09	06Oct09	109d	-18d
Waveshifter PO issued	22May09	22Jun09	23Nov09	107d	-20d
DOE OECM - FRA EVMS Certified	01Jun09	29Sep09	01Jun09	-85d	-84d
DOE OHEP CD-3b Review	01Jun09	23Jul09	01Jun09	-37d	-36d
Extrusion PO issued	01Oct09	01Oct09	01Apr10	122d	0
WLS fiber PO issued	02Nov09	02Nov09	03May10	123d	0
IPND blocks completed	09Apr10	02Apr10	08Oct10	131d	5d
Decision point for buying additional waveshifter powders	11May10	07Jun10	11Nov10	111d	-18d
Mineral oil PO issued	01Oct10	01Oct10	01Apr11	124d	0
APDs PO issued	03Jan11	03Jan11	01Jul11	127d	0
Block pivoter completed	20Apr11	20Apr11	20Oct11	127d	0
Decision point for buying additional APDs	11Nov11	11Nov11	11May12	123d	0
MI Ring Modifications Ready for Beam Transport	14Dec11	09May12	14Jun12	24d	-100d
Decision point for buying additional WLS fiber	23Feb12	23Feb12	23Aug12	128d	0
RR Modifications Ready for Beam Transport	10May12	10May12	09Nov12	127d	0
Decision point for buying additional extrusions, modules, mineral oil, pseudocumene	13Feb13	06Feb13	13Aug13	132d	5d
Far Detector extrusions for 14kt completed	20Mar13	20Mar13	20Sep13	128d	0
Far detector modules for 14 kt shipped	15Aug13	08Aug13	15Nov13	69d	5d
Ready to Commission Upgrades with Medium Energy Neutrino Beam	03Sep13	03Sep13	03Mar14	121d	0

FY09 FY10 FY11 FY12 FY13 FY14
Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3

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Sort: BaselineFinish
Run: 12Mar09

Baseline: NOVA_PMB
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